GenCore version 4.5

OM protein - protein search, using sw model

Run on: November 5, 2001, 15:20:30 ; Search time 65.26 Seconds
(without alignments)
341.858 Million cell updates/sec

Title: US-09-593-316-4
Perfect score: 2008
Sequence: 1 MNVKGKVILSMLVVSTVIVV.....IKLVKMSWQTKEYNVVRNNV 368

Scoring table: BLOSUM62
Gapop 10.0 , Gapext 0.5

Searched: 412676 seqs, 60623988 residues

Total number of hits satisfying chosen parameters: 412676

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

Database : A_Geneseq_0601:*
1: /cgn1_9/gcgdata/geneseq/geneseqp/AA1980.DAT:*
2: /cgn1_9/gcgdata/geneseq/geneseqp/AA1981.DAT:*
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21: /cgn1_9/gcgdata/geneseq/geneseqp/AA2000.DAT:*
22: /cgn1_9/gcgdata/geneseq/geneseqp/AA2001.DAT:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	% Query Match	Length	DB	ID	Description
1	1711.5	85.2	375	19	AAW49686	Porcine alpha-1,3-
2	1707.5	85.0	371	16	AAR85082	Porcine alpha (1,3
3	1707	85.0	376	16	AAR80016	Marmoset alpha-1,3
4	1700.5	84.7	371	16	AAR76777	Pig alpha-1,3-gala
5	1648.5	82.1	359	15	AAR62508	Galactosyl transfe
6	1648.5	82.1	359	17	AAR90573	Pig alpha(1,3)-gal
7	1646.5	82.0	363	19	AAW49687	Porcine alpha-1,3-
8	1604	79.9	354	19	AAW49688	Porcine alpha-1,3-
9	1543	76.8	342	19	AAW49689	Porcine alpha-1,3-
10	1476.5	73.5	394	12	AAR13750	GDP-Fuc:[beta-D-Ga
11	1476.5	73.5	394	15	AAR45935	A glycosyltransfer
12	1476.5	73.5	394	18	AAW13639	Murine alpha(1,3)-
13	1326	66.0	313	15	AAR62507	Galactosyl transfe
14	658	32.8	375	15	AAR57021	Human A transferas
15	656	32.7	353	12	AAR11317	Histo-blood gp. A
16	656	32.7	353	15	AAR57011	Human A transferas
17	655	32.6	354	12	AAR11789	Histo-blood gp. A
18	655	32.6	354	12	AAR11790	Histo-blood gp. B
19	655	32.6	354	12	AAR11792	Histo-blood gp. B
20	655	32.6	354	15	AAR57020	Human A transferas
21	641	31.9	358	15	AAR57014	Human B transferas
22	639	31.8	354	15	AAR57013	Human A transferas
23	639	31.8	354	15	AAR57016	Human B transferas
24	473	23.6	195	15	AAR57024	Partial sequence o
25	271.5	13.5	100	20	AAY26039	Secreted protein n
26	266.5	13.3	106	21	AAY86491	Human gene 59-enco
27	253	12.6	154	15	AAR57025	hgt4 showing homol
28	224.5	11.2	90	21	AAY86273	Human secreted pro
29	224.5	11.2	90	21	AAY86323	Human secreted pro
30	224.5	11.2	90	21	AAY86489	Human gene 59-enco
31	102.5	5.1	517	16	AAR66402	GalNAc-transferase
32	102.5	5.1	517	18	AAW16489	Honeybee melittin
33	102.5	5.1	559	16	AAR66397	Cattle GalNAc-tran
34	102.5	5.1	559	16	AAR66401	GalNAc-transferase
35	102.5	5.1	559	18	AAW16484	Bovine N-acetylgal
36	101.5	5.1	561	21	AAB43561	Human cancer assoc
37	95	4.7	703	22	AAB70687	Pyrococcus furiosu
38	95	4.7	722	22	AAB70686	Pyrococcus furiosu
39	92.5	4.6	246	16	AAR74036	Human chondrocalci
40	92.5	4.6	1418	21	AAY96124	Collagen type II a
41	92.5	4.6	1487	19	AAW61562	Human type II coll
42	90	4.5	708	20	AAY06547	SV40 large T antig
43	89.5	4.5	1418	15	AAR59751	Type II collagen.
44	89.5	4.5	1418	16	AAR71703	Collagen alpha 1 (
45	89.5	4.5	1418	22	AAB35624	Human type II coll

ALIGNMENTS

RESULT 1
AAW49686
ID AAW49686 standard; Protein; 375 AA.
XX
AC AAW49686;
XX
DT 10-NOV-1998 (first entry)
XX
DE Porcine alpha-1,3-galactosyl transferase isoform 1.
XX
KW Isoform; porcine; enzyme; alpha-1,3-galactosyl transferase; galactose;
KW sugar; N-acetyllactosamine; glycoprotein; glycolipid; antibody; pig;
KW graft tissue rejection; organ transplantation; xenotransplant.
XX
OS Sus scrofa.
XX
PN FR2751346-A1.
XX
PD 23-JAN-1998.
XX
PF 19-JUL-1996; 96FR-0009077.
XX
PR 19-JUL-1996; 96FR-0009077.
XX
PA (INRM) INSERM INST NAT SANTE & RECH MEDICALE.
XX
PI Pourcel C, Soulillou JP, Vanhove B;
XX
DR WPI; 1998-112876/11.
DR N-PSDB; AAV49453.
XX
PT Transgenic non-human donors of organs for human recipients -
PT containing DNA encoding antibodies that inhibit graft rejection
XX

```
PS   Claim 4; Page 42-44; 71pp; French.
XX
CC   This sequence represents isoform 1 of the porcine enzyme
CC   alpha-1,3-galactosyl transferase (alpha-1,3-GT).  The enzyme catalyses
CC   the attachment of a galactose sugar molecule on the N-acetyllactosamine
CC   moiety found on surface glycoproteins and glycolipids.  These sugar
CC   molecules are partly responsible for raising anti-graft antibodies, which
CC   lead to graft tissue rejection.  The invention relates to a method of
CC   inhibiting the graft rejection mechanism by introducing the sequence
CC   encoding an antibody targeted to alpha-1,3-GT into the cells of animal,
CC   especially a pig, from whom organs may be used for xenotransplants.
CC   Neutralisation of the alpha-1,3-GT leads to tissues or organs lacking
CC   the galactose on the glycoproteins and glycolipids, thus preventing
CC   induction of the rejection response.
XX
SQ   Sequence   375 AA;


  Query Match             85.2%;  Score 1711.5;  DB 19;  Length 375;
  Best Local Similarity   83.9%;  Pred. No. 7.6e-165;
  Matches  312;  Conservative   30;  Mismatches   25;  Indels    5;  Gaps    3;

Qy       1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
           |||||:|:||||:||||:|||||||:|||||||||  |:|||| ||| |:||| | ||||
Db       5 mnvkgrvvlsmllvstvmvvfweyinspeqsltwiyqsknpev-qssaqrqwwfpswfnn 63

Qy      61 G--YHEEDGDINEEKEQRNED-ESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRA 116
           |  |||| | |||| ||   :| | |||| |||||||:|:||||||||||||
Db      64 qthsyheeedaiqnekeqrkedhrqelplvdwfnpekrpevvtitrwkapvvweqtynra 123

Qy     117 VIDNYYAKQKITVGLTVPFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLI 176
           |||||||||||||||| |||||||||||| ||| :|||| |||||||||:||||||
Db     124 vldnyyakqkitvqltvlavqryiehyleeflisantyfmvqhkvifyimvddisrmpli 183

Qy     177 ELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGV 236
           ||||||||||:|| ||||||||||||||||||:|||||||||||||||||||: |||
Db     184 elqplrstkvteiksekrwqdismmrmktiqehilahiqhevdflfcmdvdqvfqnnfgv 243

Qy     237 ETLGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQ 296
           ||||:|||||||||| |::|||||||||||||||:|||||||||||||||||||||||
Db     244 etlqqsvaqlqawwykahpdettyerrkesaayipfqqqdfyyhaaifgqtptqvlnitq 303

Qy     297 ECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSW 356
           |||||||:|:|||||:|||||||||||||||||||||||||||||:  |||:|||:|
Db     304 ecfkqilqdkendieadwhdeshlnkyfllnkptkilspeycwdyhiqmsvdirivkiaw 363

Qy     357 QTKEYNVVRNNV 368
           | ||||:||||:
Db     364 qkkeynlvrnni 375


RESULT   2
AAR85082
ID   AAR85082 standard; Protein; 371 AA.
XX
AC   AAR85082;
XX
DT   04-JUN-1996  (first entry)
XX
DE   Porcine alpha (1,3) galactosyltransferase.
XX
KW   Transgenic; swine; porcine; alpha (1,3) galactosyltransferase;
KW   antisense; ribozyme; Gal-alpha-1,3-Gal-beta-1-4GlcNAc; epitope;
KW   terminal; xenogenic; transplant; rejection; gene therapy; pig.
XX
OS   Sus scrofa.
XX
PN   WO9528412 A1.
XX
PD   26-OCT-1995.
XX
PF   11-MAR-1995;   95WO-US04940.
XX
PR   13-APR-1994;   94US-0228933.
XX
PA   (BIOT-) BIOTRANSPLANT INC.
PA   (GEHO ) GEN HOSPITAL CORP.
PA   (CHIL-) INST CHILD HEALTH.
XX
PI   Baetscher MW,  Gustafsson KT,  Sachs DH;
XX
DR   WPI; 1995-373759/48.
DR   N-PSDB; AAT02892.
XX
PT   Novel transgenic alpha (1,3) galactosyl:transferase negative swine
PT   - used to produce rejection resistant cells for xenogenic
PT   transplantation
XX
PS   Claim 11; Pages 35-37; 56pp; English.
XX
CC   Transgenic swine in which the normal expression of the alpha (1,3)
CC   galactosyltransferase (AGT) AAR85082 is prevented, are prepd. by
CC   inhibiting the expression of the AGT gene AAT02892 using antisense
CC   oligonucleotides or ribozyme inactivators in a pluripotent porcine
CC   embryonic stem cell. It is then inserted into a porcine oocyte
CC   (from which the pronuclear material has been removed), which is
CC   itself grown to produce the transgenic swine. Swine which do not
CC   express AGT will not produce carbohydrate moieties contg. the
CC   distinctive terminal Gal-alpha-1,3-Gal-beta-1-4GlcNAc epitope,
CC   which is a significant factor in xenogenic (esp. human) transplant
CC   rejection of swine grafts. Therefore the swine cells produced in
CC   the AGT negative transgenic swine are xenogenic transplant
CC   rejection resistant, and can therefore be used by a transplant
CC   recipient, or to provide gene therapy.
XX
SQ   Sequence   371 AA;


  Query Match             85.0%;  Score 1707.5;  DB 16;  Length 371;
  Best Local Similarity   83.9%;  Pred. No. 1.9e-164;
  Matches  312;  Conservative   29;  Mismatches   26;  Indels    5;  Gaps    3;

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           |||||:|:||||:||||:|||||||:|||||||||  |:|||| ||| |:||| | ||||
Db       1 mnvkgrvvlsmllvstvmvvfweyinspeqsltwiyqsknpev-qssaqrqwwfpswfnn 59

Qy      61 G---YHEEDGDINEEKEQRNED-ESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRA 116
           |   |||| | |||| ||   :| | |||| |||||||:|:||||||||||||
Db      60 qthsyheeedaiqnekeqrkedhrqelplvdwfnpekrpevvtitrwkapvvweqtynra 119

Qy     117 VIDNYYAKQKITVGLTVPFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLI 176
           |||||||||||||||| |||||||||||| ||| :|||| |||||||||:||||||
Db     120 vldnyyakqkitvrltvfavqryiehyleeflisantyfmvqhkvifyimvddisrmpli 179

Qy     177 ELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGV 236
           ||||||||||:|| ||||||||||||||||||:|||||||||||||||||||: |||
Db     180 elqplrstkvteiksekrwqdismmrmktiqehilahiqhevdflfcmdvdqvfqnnfqv 239

Qy     237 ETLGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQ 296
           ||||:|||||||||| |::|||||||||||||||:|||||||||||||||||||||||
Db     240 etlqqsvaqlqawwykahpdettyerrkesaayiptqqqdtyyhaaifgqtptqvlnitq 299

Qy     297 ECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSW 356
           |||||||:|:|||||:|||||||||||||||||||||||||||||:  |||:|||:|
Db     300 ecfkqilqdkendieadwhdeshlnkyfllnkptkilspeycwdyhiqmsvdirivkiaw 359

Qy     357 QTKEYNVVRNNV 368
           | ||||:||||:
Db     360 qkkeynlvrnni 371


RESULT   3
AAR80016
ID   AAR80016 standard; Protein; 376 AA.
XX
AC   AAR80016;
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XX
DT   01-MAY-1996  (first entry)
XX
DE   Marmoset alpha-1,3-galactosyltransferase.
XX
KW   Marmoset; alpha-1,3-galactosyltransferase; immune response; glycoprotein;
KW   alpha-galactosyl epitope; cell membrane; virus; phagocytosis; tumour;
KW   antigen processing; leukemia; lymphoma; myeloma; melanoma; carcinoma;
KW   sarcoma; vaccine; opsonisation; glycoprotein; antibody; anti-Gal.
XX
OS   Callithrix jacchus.
XX
PN   WO9524924-A1.
XX
PD   21-SEP-1995.
XX
PF   13-MAR-1995;   95WO-US03156.
XX
PR   15-MAR-1994;   94US-0213200.
XX
PA   (UYHA-) UNIV HAHNEMANN & MEDICAL COLLEGE PENNSYL.
XX
PI   Galili U,  Repik PM;
XX
DR   WPI; 1995-336816/43.
DR   N-PSDB; AAT04522.
XX
PT   Association of an alpha-galactosyl epitope with a tumour or viral
PT   antigen - is administered to anti-Gal synthesising animals to induce
PT   an immune response
XX
PS   Disclosure; Fig 9; 85pp; English.
XX
CC   The amino acid sequence of the marmoset alpha-1,3-galactosyltransferase.
CC   The enzyme can be used in methods of enhancing an immune response by
CC   associating the alpha-galactosyl epitope with a cell membrane or viral
CC   glycoprotein.  The alpha-galactosyl epitope enhances phagocytosis and
CC   subsequent processing of the antigen. The method is useful in the
CC   treatment of tumours e.g. leukemia, lymphoma, myeloma, melanoma,
CC   carcinoma and sarcoma, or for the generation of viral vaccines by
CC   opsonising a viral glycoprotein.  The alpha-galactosyl epitope enhances
CC   recognition of the antigen in an animal that synthesises the naturally
CC   occuring antibody - anti-Gal.
XX
SQ   Sequence   376 AA;


  Query Match             85.0%;  Score 1707;  DB 16;  Length 376;
  Best Local Similarity   82.2%;  Pred. No. 2.2e-164;
  Matches  309;  Conservative   33;  Mismatches   26;  Indels    8;  Gaps    2;

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           |||||||||||||||||||||||||||:|||||  ||  |:||||  || || || | ||||
Db       1 mnvkqkvilsmlvvstvivvfweyinspegsflwiyhsknpevddssaqkdwwfpgwfnn 60

Qy      61 GYH-----EEDGDI---NEEKEQRNEDESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGT 112
           | |     ||| |     ||:::: :| ::|:| ||||| |||||:|:|:|||||||||
Db      61 qihnyqqceedtdkekgreeeqkkeddttelrlwdwfnpkkrpevmtvtqwkapvvwegt 120

Qy     113 YNRAVLDNYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSR 172
           ||:|:|:||||||||||||||:|||||||||||:||||::|||||  ||||:||||||:
Db     121 ynkailenyyakqkitvqltvtaigryiehyleefvtsanryfmvqhkvifyvmvddvsk 180

Qy     173 MPLIELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQD 232
           | ||||||||||||::|||||||||||||||||||||:|||||||||||||||||||||
Db     181 apfielgplrsfkvfevkpekrwqdismmrmktigehilahiqhevdflfcmdvdqvfqd 240

Qy     233 KFGVETLGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVL 292
           |||||||:|||||||||||||:|||||||||||||||||:|||||||||||||||| |||
Db     241 hfgvetlgqsvaqlqawwykadpddftyerrkesaayipfgqqdfyyhaaifggtpiqvl 300

Qy     293 NITQECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLV 352
           |||||||||| |||||||||:||||||||||||||||:|||||||||||||||||:||| |
Db     301 nitqecfkgilldkkndieaewhdeshlnkyfllnkpskilspeycwdyhiqlpsdiktv 360

Qy     353 KMSWQTKEYNVVRNNV 368
           |:|||||||||:|| ||
Db     361 kiswqtkeynlvrknv 376


RESULT   4
AAR76777
ID   AAR76777 standard; Protein; 371 AA.
XX
AC   AAR76777;
XX
DT   11-DEC-1995  (first entry)
XX
DE   Pig alpha-1,3-galactosyltransferase.
XX
KW   Alpha-1,3-galactosyltransferase; alpha-1,3-GalT; transgenic animal;
KW   pig; hyperacute rejection; xerotransplantation; donor organ;
KW   allograft rejection; Gal epitope; gene disruption;
KW   homologous recombination; knock-out.
XX
OS   Sus scrofa.
XX
PN   WO9520661-A1.
XX
PD   03-AUG-1995.
XX
PF   27-JAN-1995;   95WO-IB00088.
XX
PR   26-JAN-1995;   95US-0188607.
PR   27-JAN-1994;   94US-0188607.
XX
PA   (BRES-) BRESATEC LTD.
PA   (SVIN-) ST VINCENT'S HOSPITAL MELBOURNE LTD.
XX
PI   Crawford RJ,  Dapice AJF,  Pearse MJ,  Rathjen PD;
PI   Robbins AJ;
XX
DR   WPI; 1995-275446/36.
DR   N-PSDB; AAQ93077.
XX
PT   New alpha-1,3-galactosyltransferase and leukaemia inhibitor factor
PT   - corresp. DNA and nucleic acid constructs for inactivating the
PT   transferase gene; for eliminating hyperacute region in human
PT   transplants
XX
PS   Claim 3; Fig.5; 184pp; English.
XX
CC   cDNA encoding porcine alpha-1,3-GalT was generated from liver RNA
CC   using primers based on conserved regions of the mouse and cattle alpha-
CC   1,3-GalT genes.  Potential sites to interrupt the alpha-1,3-GalT gene
CC   (via homologous recombination) were identified in exons 4, 7, 8 and 9.
CC   Such inactivation allows the breeding of 'knock-out' animals, e.g.
CC   pigs suitable as donors of organs to overcome hyperacute rejection
CC   problems in human xenotransplantation.
XX
SQ   Sequence   371 AA;


  Query Match             84.7%;  Score 1700.5;  DB 16;  Length 371;
  Best Local Similarity   83.3%;  Pred. No. 9.8e-164;
  Matches  310;  Conservative   31;  Mismatches   26;  Indels    5;  Gaps    3;

Qy       1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
           |||||:|:||||:||||:|||||||:||||||||  |:|||| ||| |:||| | ||||
Db       1 mnvkgrvvlsmllvstvmvvfweyinspeqslfwiyqsknpev-qssaqrqwwfpswfnn 59

Qy      61 G---YHEEDGDINEEKEQRNED-ESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRA 116
           |   ||||:  |  ||||| ||   :| | ||||| |||||||:|:|||||||||||||
Db      60 gthsyheeedaignekeqrkednrqelplvdwfnpekrpevvtitrwkapvvwegtynra 119

Qy     117 VLDNYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLI 176
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Db    120 vldnynakqkitvqltvfavqryiehyleetlisantyfmvqhkvifyimvddisrmpli 179

Qy    177 ELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGV 236

Db    180 elqplrsfkvteiksekrwqdismmrmktiqehilahiqhevdfltcmdvdqvtqnnfqv 239

Qy    237 ETIGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQ 296

Db    240 etlqqsvaqlqawwykahpdeftyerrkesaayiptqqqdfyyhaaifgqtptqvlnitq 299

Qy    297 ECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSW 356

Db    300 ecfkqilqdkendieaewhdeshlnkyflinkptkilspeycwdyhiqmsvdirivkiaw 359

Qy    357 QTKEYNVVRNNV 368

Db    360 qkkeynlvrnni 371


RESULT   5
AAR62508
ID   AAR62508 standard; Protein; 359 AA.
XX
AC   AAR62508;
XX
DT   26-JUN-1995  (first entry)
XX
DE   Galactosyl transferase clone product.
XX
KW   Gal-alpha (1,3) galactosyl transferase; xenograft; transplant;
KW   rejection.
XX
OS   Sus scrofa domestica.
XX
PN   WO9421799 A.
XX
PD   29-SEP-1994.
XX
PF   15-MAR-1994;   94WO-AU00126.
XX
PR   16-MAR-1993;   93AU-0007854.
XX
PA   (AUST ) AUSTIN RES INST.
XX
PI   McKenzie IFC,  Sandrin MS;
XX
DR   WPI; 1994-317019/39.
DR   N-PSDB; AAQ74712.
XX
PT   DNA sequences encoding Gal alpha (1,3)galactosyl transferase -
PT   and clones contg. such sequences are used in xenograft therapies
XX
PS   Disclosure; Page 35; 50pp; English.
XX
CC   The sequence is that of the product of the porcine Gal-alpha (1,3)
CC   galactosyl transferase gene which produces a Gal epitope on the
CC   surface of porcine cells.  This epitope is recognised by antibodies
CC   which are responsible for hyperacute rejection of xenotransplanted
CC   pig cells, tissues and organs.
CC   See also AAR62507.
XX
SQ   Sequence   359 AA;


  Query Match             82.1%;  Score 1648.5;  DB 15;  Length 359;
  Best Local Similarity   81.5%;  Pred. No. 1.7e-158;
  Matches  304;  Conservative   30;  Mismatches   22;  Indels   17;  Gaps    4;

Qy        1 MNVKGKVILSMLVVSIVIVVFWEYIHSPESCSLEWINPSRNPEVGGSSIQKGWWLPRWFNN 60

Db        1 mnvkgrvvlsmllvstvmvvfweyi----- -----nrnpev-qssaqrqwwlpswfnn 47
```

```
Qy       61 G---YHEEDGDINEEKEQRNED-ESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRA 116

Db       48 qthsyheeedaiqnekeqrkednrqelplvdwfnpokrpevvtitrwkapvvweqtynra 107

Qy      117 VLDNYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLI 176

Db      108 vldnyyakqkitvqltvfavgryiehyleetlisantyfmvqhkvifyimvddisrmpli 167

Qy      177 ELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGV 236

Db      168 elqplrsfkvteiksekrwqdismmrmktiqehilahiqhevdfltcidvdqvfqnnfqv 227

Qy      237 ETIGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQ 296

Db      228 etlqqsvaqlqawwykahpdeftyerrkesaayiptqqqdfyyhaaifgqtptqvlnitq 287

Qy      297 ECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSW 356

Db      288 ecfkqilqdkendieaewhdeshlnkyflinkptkilspeycwdyhiqmsvdirivkiaw 347

Qy      357 QTKEYNVVRNNV 368

Db      348 qkkeynlvrnni 359


RESULT   6
AAR90573
ID   AAR90573 standard; Protein; 359 AA.
XX
AC   AAR90573;
XX
DT   08-APR-1996  (first entry)
XX
DE   Pig alpha(1,3)-galactosyltransferase.
XX
KW   Alpha(1,3)galactosyltransferase; xenograft hyperacute rejection;
KW   transplantation; galactose alpha(1,3) galactose.
XX
OS   Sus scrofa.
XX
PN   WO9534202-A1.
XX
PD   21-DEC-1995.
XX
PF   14-JUN-1995;   95WO-US07554.
XX
PR   21-JUL-1994;   94US-0278282.
PR   15-JUN-1994;   94US-0260201.
XX
PA   (ALEX ) ALEXION PHARM INC.
PA   (AUST-) AUSTIN RES INST.
XX
PI   Fodor WL,  McKenzie IFC,  Rother RP,  Sandrin MS,  Squinto SP;
XX
DR   WPI; 1996-049326/05.
DR   N-PSDB; AAT12242.
XX
PT   Redn. of rejection of xenogeneic cells following transplantation -
PT   by introducing a vector expressing fucosyl:transferase into the
PT   cells
XX
PS   Example 2; Page 52-54; 69pp; English.
XX
CC   Pig alpha(1,3)-galactosyltransferase (AAR90573) was expressed in
CC   monkey COS cells following transfection of the cells with
CC   vector pGT which contains an insert including the encoding
CC   cDNA (AAT12242).  Co-transfection of these cells with vector pHT
CC   encoding human H-transferase (AAR90572) resulted in a reduction in
CC   the levels of galactose alpha(1,3) galactose epitopes expressed
CC   by the cells.
XX
SQ   Sequence   359 AA;
```

```
  Query Match             82.1%;  Score 1648.5;  DB 17;  Length 359;
  Best Local Similarity   81.5%;  Pred. No. 1.7e-158;
  Matches  303;  Conservative   30;  Mismatches   22;  Indels   17;  Gaps    4;

Qy       1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
           |||||:|:||||:||||:|||||||             :||||| ||| |:||| | ||||
Db       1 mnvkgrvvlsmllvstvmvvtweyi------------nrnpev-gssaqrgwwfpswfnn 47

Qy      61 G---YHEEDGDINEEKEQRNED-ESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRA 116
           |   ||||:  |  ||||| ||   :| | ||||| |||||||:|:||||||||||||||
Db      48 gthsyheeedaignekeqrkednrgelplvdwfnpekrpevvtitrwkapvvwegtynra 107

Qy     117 VLDNYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLI 176
           |||||||||||||||||||||||||||||| ||| :||||| |||||||||:||||||
Db     108 vldnyyakqkitvgltvfavgryiehyleeflisantyfmvghkvifyimvddisrmpli 167

Qy     177 ELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGV 236
           |||||||||||:|| ||||||||||||||||||:||||||||||||:|||||||: |||
Db     168 elgplrsfkvfeiksekrwqdismmrmktigehilahiqhevdflfcidvdqvfqnnfgv 227

Qy     237 ETLGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQ 296
           ||||:|||||||||| |::|||||||||||||||:|||||||||||||||||||||||||
Db     228 etlgqsvaqlqawwykahpdeftyerrkesaayipfqqqdfyyhaaifqgtptqvlnitq 287

Qy     297 ECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSW 356
           |||||||:||:|||||:|||||||||||||||||||||||||||:  ||:|||:||
Db     288 ecfkgilqdkendieaewhdeshlnkyfllnkptkilspeycwdyhigmsvdirivkiaw 347

Qy     357 QTKEYNVVRNNV 368
           | ||||:||||:
Db     348 qkkeynlvrnni 359


RESULT   7
AAW49687
ID   AAW49687 standard; Protein; 363 AA.
XX
AC   AAW49687;
XX
DT   10-NOV-1998  (first entry)
XX
DE   Porcine alpha-1,3-galactosyl transferase isoform 2.
XX
KW   Isoform; porcine; enzyme; alpha-1,3-galactosyl transferase; galactose;
KW   sugar; N-acetyllactosamine; glycoprotein; glycolipid; antibody; pig;
KW   graft tissue rejection; organ transplantation; xenotransplant.
XX
OS   Sus scrofa.
XX
PN   FR2751346-A1.
XX
PD   23-JAN-1998.
XX
PF   19-JUL-1996;   96FR-0009077.
XX
PR   19-JUL-1996;   96FR-0009077.
XX
PA   (INRM ) INSERM INST NAT SANTE & RECH MEDICALE.
XX
PI   Pourcel C,  Soulillou JP,  Vanhove B;
XX
DR   WPI; 1998-112876/11.
DR   N-PSDB; AAV49454.
XX
PT   Transgenic non-human donors of organs for human recipients -
PT   containing DNA encoding antibodies that inhibit graft rejection
XX
PS   Claim 4; Page 36-37; 71pp; French.
XX
CC   This sequence represents isoform 2 of the porcine enzyme
CC   alpha-1,3-galactosyl transferase (alpha-1,3-GT).  The enzyme catalyses
CC   the attachment of a galactose sugar molecule on the N-acetyllactosamine
CC   moiety found on surface glycoproteins and glycolipids.  These sugar
CC   molecules are partly responsible for raising anti-graft antibodies, which
CC   lead to graft tissue rejection.  The invention relates to a method of
CC   inhibiting the graft rejection mechanism by introducing the sequence
CC   encoding an antibody targeted to alpha-1,3-GT into the cells of animal,
CC   especially a pig, from whom organs may be used for xenotransplants.
CC   Neutralisation of the alpha-1,3-GT leads to tissues or organs lacking
CC   the galactose on the glycoproteins and glycolipids, thus preventing
CC   induction of the rejection response.
XX
SQ   Sequence   363 AA;


  Query Match             82.0%;  Score 1646.5;  DB 19;  Length 363;
  Best Local Similarity   81.5%;  Pred. No. 2.8e-158;
  Matches  303;  Conservative   29;  Mismatches   23;  Indels   17;  Gaps    4;

Qy       1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
           |||||:|:||||:||||:|||||||             :||||| ||| |:||| | ||||
Db       5 mnvkgrvvlsmllvstvmvvfweyi------------nrnpev-gssaqrgwwipswfnn 51

Qy      61 G---YHEEDGDINEEKEQRNED-ESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRA 116
           |   ||||:  |  ||||| ||   :| | ||||| |||||||:|:||||||||||||||
Db      52 gthsyheeedaignekeqrkednrgelplvdwfnpekrpevvtitrwkapvvweqtynra 111

Qy     117 VLDNYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLI 176
           |||||||||||||||| ||||||||||||| ||| :||||| |||||||||:||||||
Db     112 vldnyyakqkitvgltvlavgryiehyleeflisantyfmvghkvifyimvddisrmpli 171

Qy     177 ELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGV 236
           |||||||||||:|| ||||||||||||||||||:||||||||||||:|||||||: |||
Db     172 elgplrsfkvfeiksekrwqdismmrmktigehilahiqhevdflfcmdvdqvfqnntgv 231

Qy     237 ETLGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQ 296
           ||||:|||||||||| |::|||||||||||||||:|||||||||||||||||||||||||
Db     232 etlqqsvaqlqawwykahpdeftyerrkesaayipfqqqdfyyhaaifqgtptqvlnitq 291

Qy     297 ECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSW 356
           |||||||:||:|||||:|||||||||||||||||||||||||||:  ||:|||:||
Db     292 ecfkgilqdkendieaewhdeshlnkyfllnkptkilspeycwdyhigmsvdirivkiaw 351

Qy     357 QTKEYNVVRNNV 368
           | ||||:||||:
Db     352 qkkeynlvrnni 363


RESULT   8
AAW49688
ID   AAW49688 standard; Protein; 354 AA.
XX
AC   AAW49688;
XX
DT   10-NOV-1998  (first entry)
XX
DE   Porcine alpha-1,3-galactosyl transferase isoform 3.
XX
KW   Isoform; porcine; enzyme; alpha-1,3-galactosyl transferase; galactose;
KW   sugar; N-acetyllactosamine; glycoprotein; glycolipid; antibody; pig;
KW   graft tissue rejection; organ transplantation; xenotransplant.
XX
OS   Sus scrofa.
XX
PN   FR2751346-A1.
XX
PD   23-JAN-1998.
XX
PF   19-JUL-1996;   96FR-0009077.
XX
PR   19-JUL-1996;   96FR-0009077.
XX
PA   (INRM ) INSERM INST NAT SANTE & RECH MEDICALE.
XX
PI   Pourcel C,  Soulillou JP,  Vanhove B;
```

XX
DR WPI; 1998-112876/11.
DR N-PSDB; AAV49455.
XX
PT Transgenic non human donors of organs for human recipients -
PT containing DNA encoding antibodies that inhibit graft rejection
XX
PS Claim 4; Page 39-41; 71pp; French.
XX
CC This sequence represents isoform 3 of the porcine enzyme
CC alpha-1,3-galactosyl transferase (alpha-1,3-GT). The enzyme catalyses
CC the attachment of a galactose sugar molecule on the N-acetyllactosamine
CC moiety found on surface glycoproteins and glycolipids. These sugar
CC molecules are partly responsible for raising anti-graft antibodies, which
CC lead to graft tissue rejection. The invention relates to a method of
CC inhibiting the graft rejection mechanism by introducing the sequence
CC encoding an antibody targeted to alpha-1,3-GT into the cells of animal,
CC especially a pig, from whom organs may be used for xenotransplants.
CC Neutralisation of the alpha-1,3-GT leads to tissues or organs lacking
CC the galactose on the glycoproteins and glycolipids, thus preventing
CC induction of the rejection response.
XX
SQ Sequence 454 AA;

Query Match 79.9%; Score 1604; DB 19; Length 454;
Best Local Similarity 79.9%; Pred. No. 5.4e-154;
Matches 295; Conservative 30; Mismatches 24; Indels 20; Gaps 2;

```
Qy       1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
          ||||||:|||||:|||||:|||||||:|||||||||  ||:                   :
Db       5 mnvkqrvvlsmllvstvmvvtweyinspegslfwiyqsk------------------th 45

Qy      61 GYHEEDGDINEEKEQRNED-ESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRAVLD 119
           ||||:  |  |||||| ||   :| | ||||| |||||||:|:||||||||||||||||
Db      46 syheeedaiqnekeqrkednrqelplvdwtnpekrpevvtitrwkapvvweqtynravld 105

Qy      20 NYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLIELG 179
           |||||||||||||| |||||||||||||| ||| :||||| |||||||||:|||||||||
Db     106 nyyakqkitvqltvlavqryiehyleeflisantyimvghkvifyimvddisrmplielq 165

Qy     180 PLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGVETL 239
           |||||||||:|| ||||||||||||||||||:|||||||||||||||||||: ||||||
Db     166 plrstkvfeiksekrwqdismmrmktigehilahiqhevdfltcmdvdqvfqnntfqvetl 225

Qy     240 GESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQECF 299
           |:|||||||||| |::|||||||||||||:|||||||||||||||||||||||||||||
Db     226 gqsvaqlqawwykahpdettyerrkesaayipfqqqdfyyhaaifgqtptqvlnitqecf 285

Qy     300 KGTLKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSWQTK 359
           ||||:||:|||||:|||||||||||||||||||||||||||||:  ||::||::|| |
Db     286 kqilqdkendieaewhdeshlnkyfllnkptkilspeycwdyhiqmsvdirivkiawqkk 345

Qy     360 EYNVVRNNV 368
           |||:|||||
Db     346 eynlvrnni 354
```

RESULT 9
AAW49689
ID AAW49689 standard; Protein; 342 AA.
XX
AC AAW49689;
XX
DT 10-NOV-1998 (first entry)
XX
DE Porcine alpha 1,3-galactosyl transferase isoform 4.
XX
KW Isoform; porcine; enzyme; alpha-1,3-galactosyl transferase; galactose;
KW sugar; N-acetyllactosamine; glycoprotein; glycolipid; antibody; pig;
KW graft tissue rejection; organ transplantation; xenotransplant.
XX
OS Sus scrofa.
XX
PN FR2751346-A1.
XX
PD 23-JAN-1998.
XX
PF 19-JUL-1996; 96FR-0009077.
XX
PR 19-JUL-1996; 96FR-0009077.
XX
PA (INRM) INSERM INST NAT SANTE & RECH MEDICALE.
XX
PI Pourcel C, Soulillou JP, Vanhove B;
XX
DR WPI; 1998-112876/11.
DR N-PSDB; AAV49456.
XX
PT Transgenic non-human donors of organs for human recipients -
PT containing DNA encoding antibodies that inhibit graft rejection
XX
PS Claim 4; Page 43-44; 71pp; French.
XX
CC This sequence represents isoform 4 of the porcine enzyme
CC alpha-1,3-galactosyl transferase (alpha-1,3-GT). The enzyme catalyses
CC the attachment of a galactose sugar molecule on the N-acetyllactosamine
CC moiety found on surface glycoproteins and glycolipids. These sugar
CC molecules are partly responsible for raising anti-graft antibodies, which
CC lead to graft tissue rejection. The invention relates to a method of
CC inhibiting the graft rejection mechanism by introducing the sequence
CC encoding an antibody targeted to alpha-1,3-GT into the cells of animal,
CC especially a pig, from whom organs may be used for xenotransplants.
CC Neutralisation of the alpha-1,3-GT leads to tissues or organs lacking
CC the galactose on the glycoproteins and glycolipids, thus preventing
CC induction of the rejection response.
XX
SQ Sequence 342 AA;

Query Match 76.8%; Score 1543; DB 19; Length 342;
Best Local Similarity 77.2%; Pred. No. 7.7e-148;
Matches 285; Conservative 29; Mismatches 23; Indels 32; Gaps 2;

```
Qy       1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
           |||||:|:||||:||||:|||||||:                                 :
Db       5 mnvkgrvvlsmllvstvmvvfweyinr------------------------------th 34

Qy      61 GYHEEDGDINEEKEQRNED-ESKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRAVLD 119
           ||||:  |  ||||| ||   :| | ||||| |||||||:|:||||||||||||||||
Db      34 syheeedaiqnekeqrkednrqelplvdwtnpekrpevvtitrwkapvvweqtynravld 93

Qy     120 NYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLIELG 179
           |||||||||||||| |||||||||||||| ||| :||||| |||||||||:|||||||||
Db      94 nyyakqkitvqltvlavqryiehyleeflisantyimvghkvifyimvddisrmplielq 153

Qy     180 PLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGVETL 239
           |||||||||:|| ||||||||||||||||||:|||||||||||||||||||: ||||||
Db     154 plrstkvfeiksekrwqdismmrmktigehilahiqhevdfltcmdvdqvfqnntfqvetl 213

Qy     240 GESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQECF 299
           |:|||||||||| |::|||||||||||||:|||||||||||||||||||||||||||||
Db     214 gqsvaqlqawwykahpdeftyerrkesaayipfqqqdfyyhaaifgqtptqvlnitqecf 273

Qy     300 KGTLKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSWQTK 359
           ||||:||:|||||:|||||||||||||||||||||||||||||:  ||::||::|| |
Db     274 kqilqdkendieaewhdeshlnkyfllnkptkilspeycwdyhiqmsvdirivkiawqkk 333

Qy     360 EYNVVRNNV 368
           |||:|||||
Db     334 eynlvrnni 342
```

RESULT 10
AAR13750
ID AAR13750 standard; Protein; 394 AA.

```
XX
AC   AAR13750;
XX
DT   07-NOV-1991  (first entry)
XX
DE   GDP-Fuc:[beta-D-Gal(1,4/1,3)]-D-GlcNAc(/Glc)alpha(1,3/1,4)
DE   -fucosyltransferase.
XX
KW   Glycosyltransferase.
XX
OS   Mus musculus.
XX
PN   WO9112340-A.
XX
PD   22-AUG-1991.
XX
PF   14-FEB-1991;   91WO-US00899.
XX
PR   12-DEC-1990;   90US-0627621.
PR   14-FEB-1990;   90US-0479858.
PR   14-FEB-1990;   90US-0480133.
XX
PA   (UNMI ) UNIV OF MICHIGAN.
XX
PI   Lowe JB;
XX
DR   WPI; 1991-267151/36.
DR   N-PSDB; AAQ13331.
XX
PT   Isolation of gene conveying post-translational characteristic -
PT   e.g. the presence of soluble or membrane bound oligo or
PT   polysaccharide or glycosyltransferase.
XX
PS   Disclosure; Fig 2; 155pp; English.
XX
CC   The amino acid sequence codes for a protein capable of functioning
CC   as a UDP- Gal:[beta-D-Gal(1,4)]-D-GlcNAc alpha (1,3)galacto-
CC   syltransferase.. The products of this enzyme, sub-terminal alpha
CC   (1,3) and alpha(1,4) fucose residues are used in the post-
CC   translational modification of the oligosaccharides on cell-surface,
CC   intracellular or secreted proteins or lipids. These can be used for
CC   the prodn. of diagnostics and therapeutics. There is a single
CC   transmembrane domain consisting of a 19 amino acid hydrophobic
CC   seqment flanked by basic residues and a large (presumably
CC   catalytic) C-terminal domain that would ultimately be targeted to
CC   the lumen of the Golgi. It has two potential N-glycosylation sites
CC   indicating that as with other glycosyltransferases, it may be
CC   synthesised as a glycoprotein. It is representative of a Type II
CC   transmembrane protein. See also AAR13749-R13752.
XX
SQ   Sequence   394 AA;
```

```
  Query Match             73.5%;  Score 1476.5;  DB 12;  Length 394;
  Best Local Similarity   72.2%;  Pred. No. 5.2e-141;
  Matches  268;  Conservative   41;  Mismatches   47;  Indels   15;  Gaps    3;

Qy       1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
           |||||||| ||:||||:||||||:           :| |||| :  || || | || |
Db      36 mnvkgkvillmlivstvvvvfweyv-----------nripevgenrwqkdwwfpswfkn 83

Qy      61 GYH--EEDGDINEEKEQRNEDE-SKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRAV 117
           | |  :||      :: || |   : :| |||||  ||:|:|:| ||||:|||||: |:
Db      84 gthsyqednvegrrekgrngdrieepqlwdwfnpknrpdvltvtpwkapivwegtydtal 143

Qy     118 LDNYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLIE 177
           |: ||| ||:|||||||||:|||||||:|| ||: :||||| ||||:|:|| ||||::
Db     144 lekyyatqkltvqltvtavgkyiehyledflesadmyfmvghrvifyvmiddtsrmpvvh 203

Qy     178 LGPLRSFKVPKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGVE 237
           | || | :||:|: |||||||||||||||||:|||||||||||||||||| ||||
Db     204 lnplhslqvfeirsekrwqdismmrmktiqehilahiqhevdflfcmdvdqvfqdnfgve 263

Qy     238 TLGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQE 297
           |||: |||||||||| | ||||||: |||||||||||||||||||||||| :||:|:|
Db     264 tlgqlvaqlqawwykaspekftyerrelsaayipfgeqdtyyhaaifggtpthilnltre 323

Qy     298 CFKGILKDKKNDIEAQWHDESHLNKYFLINKPTKILSPEYCWDYHIGLPADIKLVKMSWQ 357
           |||||:|||:|||||||||||||||| |||||||||||||| ||||:||| |||::||
Db     324 cfkgilqdkkhdieaqwhdeshlnkyflinkptkilspeycwdyqiqlpsdiksvkvawq 383

Qy     358 TKEYNVVRNNV 368
           |||||:|||||
Db     384 tkeynlvrnnv 394
```

```
RESULT  11
AAR45935
ID   AAR45935 standard; Protein; 394 AA.
XX
AC   AAR45935;
XX
DT   26-JUL-1994  (first entry)
XX
DE   A glycosyltransferase.
XX
KW   Glycosyltransferase; fucosyltransferase; GDP-Fuc; in vitro; cell;
KW   surface; oligosaccharide.
XX
OS   Homo sapiens.
XX
PN   WO9402616-A.
XX
PD   03-FEB-1994.
XX
PF   20-JUL-1993;   93WO-US06703.
XX
PR   20-JUL-1992;   92US-0914281.
XX
PA   (UNMI ) UNIV MICHIGAN.
XX
PI   Lowe JB;
XX
DR   WPI; 1994-048874/06.
DR   N-PSDB; AAQ56907.
XX
PT   DNA fragment encoding a glycosyltransferase - can be used for in
PT   vitro reactions to modify cell surface oligosaccharide(s) e.g.
PT   blood gp. determinants, to protect against transplant rejection
XX
PS   Disclosure; Fig 2; 249pp; English.
XX
CC   The sequence is that of a human glycosyl transferase.  The enzyme
CC   may be non glycosylated.  This prevents premature loss of enzyme
CC   activity.  It can also be used in in vitro reactions to modify cell
CC   surface oligosaccharide mols. e.g. blood group determinants.
CC   See also AAR45933-9.
XX
SQ   Sequence   394 AA;
```

```
  Query Match             73.5%;  Score 1476.5;  DB 15;  Length 394;
  Best Local Similarity   72.2%;  Pred. No. 5.2e-141;
  Matches  268;  Conservative   41;  Mismatches   47;  Indels   15;  Gaps    3;

Qy       1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
           |||||||| ||:||||:||||||:           :| |||| :  || || | || |
Db      36 mnvkgkvillmlivstvvvvfweyv-----------nripevgenrwqkdwwfpswfkn 83

Qy      61 GYH--EEDGDINEEKEQRNEDE-SKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRAV 117
           | |  :||      :: || |   : :| |||||  ||:|:|:| ||||:|||||: |:
Db      84 gthsyqednvegrrekgrngdrieepqlwdwfnpknrpdvltvtpwkapivwegtydtal 143

Qy     118 LDNYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLIE 177
           |: ||| ||:|||||||||:|||||||:|| ||: :||||| ||||:|:|| ||||::
Db     144 lekyyatqkltvqltvfavgkyiehyledflesadmyfmvghrvifyvmiddtsrmpvvh 203
```

```
Qy      178 LGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGVE 237
            | || | :||:|: ||||||||||||||||||||:|||||||||||||||||||| ||||
Db      204 lnplhslqvfeirsekrwqdismmrmktigehilahiqhevdflfcmdvdqvfqdnfqve 263

Qy      238 TIGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQE 297
            |||: |||||||||||| |  |||||: ||||||||||||||||||||||||| :||:|:|
Db      264 tlqqlvaqlqawwykaspekftyerrelsaayipfqegdfyyhaaifqgtpthilnltre 323

Qy      298 CFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSWQ 357
            ||||||:|||:|||||||||||||||||| ||||||||||||||| ||||:||| ||::||
Db      324 cfkqilqdkkhdieaqwhdeshlnkyflinkptkilspeycwdyqiqlpsdiksvkvawq 383

Qy      358 TKEYNVVRNNV 368
            |||||:|||||
Db      384 tkeynlvrnnv 394


RESULT 12
AAW13639
ID   AAW13639 standard; Protein; 394 AA.
XX
AC   AAW13639;
XX
DT   19-JUN-1997  (first entry)
XX
DE   Murine alpha(1,3)-galactosyltransferase.
XX
KW   Alpha(1,3)-galactosyltransferase; glycosylation; oligosaccharide.
XX
OS   Mus sp.
XX
PN   WO9709421-A1.
XX
PD   13-MAR-1997.
XX
PF   06-SEP-1996;   96WO-US13816.
XX
PR   08-SEP-1995;   95US-0525058.
XX
PA   (UNMI-) UNIV MICHIGAN.
XX
PI   Legault DJ, Lowe JB;
XX
DR   WPI; 1997-192897/17.
DR   N-PSDB; AAT61676.
XX
PT   New recombinant fucosyltransferase proteins - useful for modifying
PT   cell surface oligosaccharide structures
XX
PS   Example 2; Page 272-274; 329pp; English.
XX
CC   Murine UDP-Gal:beta-D-Gal(1,4)-D-GlcNAc alpha(1,3)-
CC   galactosyltransferase (AAW13639) catalyses the a transglycosylation
CC   reaction between UDP Gal and N-acetyllactosamine and is associated
CC   with surface localised expression of Gal(alpha1-3)Gal linkages.
CC   Its amino acid sequence was deduced from a cDNA clone (AAT61676)
CC   obtd. by transfecting COS-1 cells with cDNA derived from mouse F9
CC   teratocarcinoma cells, and screening the transfected cells for
CC   surface localised Gal(alpha1-3)Gal linkages.  When expressed in
CC   animal cell lines, the enzyme provides specific capabilities with
CC   respect to post translational modification of the oligosaccharides
CC   of expressed proteins or lipids.  The enzyme can also be used to
CC   raise antibodies and to screen for inhibitor cpds.
XX
SQ   Sequence   394 AA;


  Query Match             73.5%;  Score 1476.5;  DB 18;  Length 394;
  Best Local Similarity   72.2%;  Pred. No. 5.2e-141;
  Matches  268;  Conservative   41;  Mismatches   47;  Indels   15;  Gaps    3;

Qy        1 MNVKGKVILSMLVVSTVIVVFWEYIHSPEGSLFWINPSRNPEVGGSSIQKGWWLPRWFNN 60
```

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            ||||||||| ||:||||:||||||:           :| |||| :  || || | || |
Db       36 mnvkgkvillmlivstvvvvfweyv---------- -nripevqenrwqkdwwtpswfkn 83

Qy       61 GYH--EEDGDINEEKEQRNEDE SKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRAV 117
            | |  :||      :: || |   : :| ||||  ||:|:|:| ||||:|||||| |:
Db       84 qthsyqednvegrrekgrnqdrieepqlwdwfnpknrpdvltvtpwkapivweqtydtal 143

Qy      118 LDNYYAKQKITVGLTVFAVGRYIEHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLIE 177
            |: ||| ||:|||||||||:|||||||:|| ||: :||||| ||||:|:|| ||||::
Db      144 lekyyatqkltvgltvtavgkyiehyledflesadmyfmvghrvityvmiddtsrmpvvh 203

Qy      178 LGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGVE 237
            | || | :||:|: ||||||||||||||||||||:|||||||||||||||||||| ||||
Db      204 lnplhslqvfeirsekrwqdismmrmktigehilahiqhevdflfcmdvdqvfqdnfqve 263

Qy      238 TIGESVAQLQAWWYKADPNDFTYERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQE 297
            |||: |||||||||||| |  |||||: ||||||||||||||||||||||||| :||:|:|
Db      264 tlqqlvaqlqawwykaspekftyerrelsaayiptqeqdfyyhaaifqgtpthilnltre 323

Qy      298 CFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSWQ 357
            ||||||:|||:|||||||||||||||||| ||||||||||||||| ||||:||| ||::||
Db      324 cfkgilqdkkhdieaqwhdeshlnkytlinkptkilspeycwdyqiqlpsdiksvkvawq 383

Qy      358 TKEYNVVRNNV 368
            |||||:|||||
Db      384 tkeynlvrnnv 394


RESULT 13
AAR62507
ID   AAR62507 standard; Protein; 413 AA.
XX
AC   AAR62507;
XX
DT   26-JUN-1995  (first entry)
XX
DE   Galactosyl transferase 3' clone product.
XX
KW   Gal-alpha (1,3) galactosyl transferase; xenograft; transplant;
KW   rejection.
XX
OS   Sus scrofa domestica.
XX
PN   WO9421799-A.
XX
PD   29-SEP-1994.
XX
PF   15-MAR-1994;   94WO-AU00126.
XX
PR   16-MAR-1993;   93AU-0007854.
XX
PA   (AUST-) AUSTIN RES INST.
XX
PI   Mckenzie IFC,  Sandrin MS;
XX
DR   WPI; 1994-317019/39.
DR   N-PSDB; AAQ74711.
XX
PT   DNA sequences encoding Gal-alpha (1,3)galactosyl transferase -
PT   and clones contg. such sequences are used in xenograft therapies
XX
PS   Disclosure; Page 31; 50pp; English.
XX
CC   The sequence is that of the product of the porcine Gal-alpha (1,3)
CC   galactosyl transferase gene which produces a Gal epitope on the
CC   surface of porcine cells.  This epitope is recognised by antibodies
CC   which are responsible for hyperacute rejection of xenotransplanted
CC   pig cells, tissues and organs.
CC   See also AAR62508.
XX
SQ   Sequence   413 AA;
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  Query Match             66.0%;  Score 1326;  DB 15;  Length 313;
  Best Local Similarity   84.7%;  Pred. No. 6.4e-126;
  Matches  244;  Conservative   22;  Mismatches   22;  Indels    0;  Gaps    0;

Qy      81 SKLKLSDWFNPFKRPEVVTMTKWKAPVVWEGTYNRAVLDNYYAKQKITVGLTVFAVGRYI 140
           ||  |:  |   | ||||||:|:||||||||||||||||||||||||||||||||||||||
Db      26 skailtlcfvtrkppevvtitrwkapvvwegtynravldnyyakqkitvgltvfavgryi 85

Qy     141 EHYLEEFLTSANKHFMVGHPVIFYIMVDDVSRMPLIELGPLRSFKVFKIKPEKRWQDISM 200
           |||||||| ||| :||||| ||||||||:|||||||||||||||:|| ||||||||||
Db      86 ehyleeflisantytmvghkvityimvddisrmplielgplrsfkvfeiksekrwqdism 145

Qy     201 MRMKTIGEHIVAHIQHEVDFLFCMDVDQVFQDKFGVETLGESVAQLQAWWYKADPNDFTY 260
           ||||||||||:|||||||||||:|||||||: |||||||:|||||||||||| |::|||
Db     146 mrmktigehilahiqhevdflfcidvdqvfqnnfqvetlgqsvaqlqawwykahpdefty 205

Qy     261 ERRKESAAYIPFGEGDFYYHAAIFGGTPTQVLNITQECFKGILKDKKNDIEAQWHDESHL 320
           || |||||||||| :|||||||| ||||||||||||||||||:||:||||||:||||| |
Db     206 erpkesaayipfrqqdfyyhaailggtptqvlnitqecfkgilqdkendieaewhdesgl 265

Qy     321 NKYFLLNKPTKILSPEYCWDYHIGLPADIKLVKMSWQTKEYNVVRNNV 368
           |||||||||||||||||||||||:  ||::|| :|| ||||:||||:
Db     266 nkyfllnkptkilspeycwdyhiqmsvdirivkqawqkkeynlvrnni 313


RESULT  14
AAR57021
ID   AAR57021 standard; Protein; 375 AA.
XX
AC   AAR57021;
XX
DT   16-FEB-1995  (first entry)
XX
DE   Human A transferase (A2 subtype).
XX
KW   Blood; group; determinant; antigen; erythrocyte; oligosaccharide;
KW   glycoconjugate; glycosphingolipid; glycoprotein; glycosyltransferase;
KW   transferase.
XX
OS   Homo sapiens.
XX
FH   Key             Location/Qualifiers
FT   Region          1..53
FT                   /label= Unsure.
FT                   /note= "These amino acids are unknown."
XX
PN   US5326857-A.
XX
PD   05-JUL-1994.
XX
PF   31-AUG-1989;   89US-0402695.
XX
PR   31-AUG-1989;   89US-0402695.
PR   29-AUG-1991;   91US-0752101.
XX
PA   (BIOM-) BIOMEMBRANE INST.
XX
PI   Clausen H,  Hakomori S,  White F,  Yamamoto F;
XX
DR   WPI; 1994-217098/26.
XX
PT   Isolated DNA molecules - encode human histo-blood groups A-, B-
PT   and O-glycotransferases
XX
PS   Example 8; Figure 7; 63pp; English.
XX
CC   The histo-blood group ABH determinants are major allogeneic antigens
CC   in both erythrocytes and tissues of humans.  They generally
CC   constitute peripheral parts of the oligosaccharide chains of
CC   glycoconjugates i.e.linked to lipids (glycosphingolipids) or to
CC   proteins (glycoproteins).  It was proposed that the A and B
CC   phenotypes were associated with glycosyltransferases that converted
CC   the H substance associated with the O phenotype to A and B
CC   respectively, through the addition of alpha1-3-N-acetylgalactosamine
CC   or alpha1-3-galactosyl residues to the H antigen Fuc-alpha1-2Gal-
CC   beta1-R.  Hence, the primary products of the histo-blood group A
CC   and B genes are the respective glycosyltransferases.
XX
SQ   Sequence   375 AA;


  Query Match             32.8%;  Score 658;  DB 15;  Length 375;
  Best Local Similarity   45.3%;  Pred. No. 3.8e-58;
  Matches  124;  Conservative   50;  Mismatches   98;  Indels    2;  Gaps    2;

Qy      94 RPEVVTMTKWKAPVVWEGTYNRAVLDNYYAKQKITVGLIVFAVGRYIEHYLEEFLTSANK 153
           | :|: :| | ||:||||||:|  :|:  :  |  |:|||||: :|:  :|: || :| |
Db      81 rkdvlvvtpwlapivweqtfnidilneqfrlqnttiqltvfaikkyva-flklfletaek 139

Qy     154 HFMVGHPVIFYIMVDDVSRMPLIELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEHIVAH 213
           |||||| | :|:  | :: :| : ||  |   | :::  |||||:|| ||: | :
Db     140 hfmvghrvhyyvftdqlaavprvtlgtgrqlsvlevraykrwqdvsmrrmemisdfeerr 199

Qy     214 IQHEVDFLFCMDVDQVFQDKFGVETLGESVAQLQAWWYKADPNDFTYERRKESAAYIPFG 273
              |||:| |:|||  |:|  ||| |      |   :| :    ||||||:| ||||
Db     200 flsevdylvcvdvdmefrdhvgveiltpltgtlhpqfyqssreaftyerrpqsqayipkd 259

Qy     274 EGDFYYHAAIFGGTPTQVLNITQECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPTKIL 333
           ||||||    |||:  :|  :|: | : :: 1: | ||| ||||||||| | :||||:|
Db     260 eqdfyylqqffqqsvqevqrltrachqammvdqanqieavwhdeshlnkyllrhkptkvl 319

Qy     334 SPEYCWDYH-IGLPADIKLVKMSWQTKEYNVVRN 366
           |||| ||   :| || :: :: :   | :  |||
Db     320 speylwdqqllgwpavlrklrftavpknhqavrn 353


RESULT  15
AAR11317
ID   AAR11317 standard; Protein; 353 AA.
XX
AC   AAR11317;
XX
DT   03-JUN-1991  (first entry)
XX
DE   Histo-blood gp. A glycosyltransferase from clone FY-59-5.
XX
KW   Histo-blood group; glycosyltransferase; blood typing; tumour;
KW   suppression; group A; B; O; probe; antigen.
XX
OS   Homo sapiens.
XX
FH   Key             Location/Qualifiers
FT   Domain          17..37
FT                   /label= possible_transmembrane_domain
XX
PN   WO9103484-A.
XX
PD   21-MAR-1991.
XX
PF   30-AUG-1990;   90WO-US04942.
XX
PR   31-AUG-1989;   89US-0402695.
XX
PA   (BIOM-) BIOMEMBRANE INST.
XX
PI   Clausen H,  Yamamoto F,  White T,  Hakomori S;
XX
DR   WPI; 1991-102024/14.
DR   N-PSDB; AAQ11131.
XX
PT   DNA molecules encoding histo-blood gps. A, B  and C glycosyl
PT   transferase(s) - useful in blood typing and tumour suppression
XX
PS   Disclosure; Fig 3; 60 pp; English.
XX
CC   cDNA clone FY-59-5 encodes this protein of MW 41.000.  The N-terminus
```

CC of the soluble form begins with the alanine at position 54.
CC A hydrophobic region spanning 21 amino acids precedes this
CC N terminus and appears to be the transmembrane region of the
CC membrane-bound form of A transferase. A proline-rich region
CC (9 out of 60) follows the hydrophobic region. An N-glycosylation
CC site appears to be located at position 112 (N-T-T).
CC The remaining long C terminal portion is moderately hydrophilic.
CC See also AAQ11489 and AAR11788-93.
XX
SQ Sequence 354 AA;

Query Match 32.7%; Score 656; DB 12; Length 353;
Best Local Similarity 45.1%; Pred. No. 5.5e-58;
Matches 125; Conservative 51; Mismatches 97; Indels 4; Gaps 3;

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Qy      91 PEKRPEVVTMTKWKAPVVWEGTYNRAVLDNYYAKQKITVGLTVFAVGKYIEHYLEEFLTS 150
           |:|  :|: :| | ||:||||||:|  :|:  :  |  |:|||||: :|:  :|: || :
Db      79 pwk--dvlvvtpwlapivweqttnidilneqtrlqnttiqltvfalkkyva-flklflet 135

Qy     151 ANKHFMVGHPVIFYIMVDDVSRMPLIELGPLRSFKVFKIKPEKRWQDISMMRMKTIGEH1 210
           | ||||||| | :|:  | :: :| : || |  | ::: ||||:|| ||: | :
Db     136 ae-khfmvqhrvhyyvftdqlaavprvtfqtgrqisvfevraykrwqdvsmrrmemisdfc 195

Qy     211 VAHIQHEVDFLFCMDVDQVFQDKFGVETLGESVAQLQAWWYKADPNDFTYERRKESAAY1 270
                 |||:| |:||| |:| ||| | |  | :| :  ||||||  :| |||
Db     196 errflsevdylvcvdvdmefrdhvqveiltplfqtlhpqfyqssreaftyerrpqsqayi 255

Qy     271 PFGEGDFYYHAAIFGGTPTQVLNITQECFKGILKDKKNDIEAQWHDESHLNKYFLLNKPT 330
           |  |||||  |||:  :|  :|: | : :: |: | ||| ||||||||| | :|||
Db     256 prdeqdfyylqqfiqqsvqevqrltrachqamavdqanqioavwhdeshlnkyllrhkpt 315

Qy     331 KILSPEYCWDYH-IGLPADIKLVKMSWQTKEYNVVRN 366
           |:|||| ||  :| || :: :: :  | :  |||
Db     316 kvlspeyiwdqqflqwpavlrklrttavpkahqavrn 352
```

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